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*"Welcome Shelter Near Trail's End"*

FEDERAL-STATE COOPERATIVE  
SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for

COLORADO RIVER DRAINAGE BASIN

**FEBRUARY 1, 1947**

By

Division of Irrigation, Soil Conservation Service

United States Department of Agriculture

and

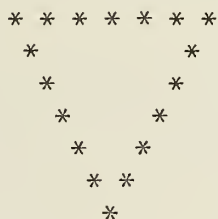
Colorado Agricultural Experiment Station

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Data included in this report were obtained by the agencies named above in cooperation with the U. S. Forest Service, National Park Service, State Engineers of Colorado, Wyoming and New Mexico and other Federal, State and local organizations.



FEDERAL-STATE COOPERATIVE  
SNOW SURVEYS AND IRRIGATION WATER FORECASTS  
FOR  
COLORADO RIVER DRAINAGE BASIN



Report Prepared by  
Division of Irrigation  
Soil Conservation Service  
and  
Colorado Agricultural Experiment Station  
Fort Collins, Colorado



WATER SUPPLY OUTLOOK  
COLORADO RIVER DRAINAGE

February 1, 1947

The prospect for normal water supplies in the Colorado River and its tributaries in Colorado is now favorable. The snow cover on the Gunnison and White Rivers is about 20 percent above normal. On the main stem of the Colorado River, the runoff prospects are slightly better than average. On the Yampa River the snow is only 75 percent of average. At higher elevations on the watershed of the San Juan and Animas Rivers the water content of the snow is about average but considerably better than last year on February 1. Precipitation in the valley areas has been deficient the past month. Soil moisture, range and crop conditions are generally good.

On the tributaries of the Colorado River in western New Mexico and in Arizona the snow is light. Precipitation has been sub-normal and reservoir storage is extremely low. The prospects for adequate irrigation water supply in Arizona are poor at this time.

COLORADO RIVER AND  
TRIBUTARIES IN COLORADO

Colorado River. The snow cover on the headwaters of the Colorado River, above Grand Junction, is about ten percent more than normal but a little less than a year ago. On areas near the Continental Divide the snow averages somewhat less than last year. This is balanced by snow on Grand Mesa which is about double that of last year and 25 percent above normal. The snow on the Roaring Fork is approximately 20 percent above last year. Storage in Green Mountain reservoir is 86,000 acre-feet in comparison with 67,000 a year ago. Precipitation has been below normal in the valley areas this past month. Soil moisture is generally good. Crop and range conditions are reported from fair to good.

Gunnison River. The water supply prospects on the Gunnison River, this coming season, are about 25 percent better than last year and slightly more than average. As for the Colorado River, the snow cover on Grand Mesa is heavy, but near the Continental Divide and on the south portion of the watershed it is average or below. The snow on Sunshine Mountain course on the Lake Fork and Iron-ton Park course on the Uncompahgre River are both about 20 percent below average and a like amount less than last year. Storage in Taylor Park reservoir is 66,500 acre-feet as compared with 82,500 a year ago. Soil moisture conditions are poor to fair. Crop and range conditions are generally reported as good. Stream flow is slightly below normal.





Yampa and White Rivers. The water content of the snow on the headwaters of the Yampa, as shown by recent snow surveys, is about 25 percent below last year and slightly under average. The snow at Columbine Lodge and Dry Lake snow courses, east of Steamboat Springs, is especially deficient. At the head of the Yampa and Elk Rivers the water content is average. The snow cover at higher elevations on the White River is normal and about the same as a year ago. Soil moisture conditions on these drainages is reported to be good. The crop area in the upper valley is snow covered at this time.

San Juan River. On the watersheds of the San Juan and Animas Rivers snow is about average for this time of year. The water content of the snow on Wolf Creek Pass and west along the Continental Divide is two to three times more than it was a year ago. At lower elevations it is somewhat below average. Precipitation on the New Mexico tributaries of the San Juan is deficient. Soil moisture is good due to fall rains. Range and crop conditions are also good. The present storage in Vallecito Reservoir, on the Los Piños River, is 57,000 acre-feet as compared with 39,000 a year ago.

Dolores River. According to recent snow surveys the water content measured on courses on the Dolores River is about average and the same as a year ago. During the fall the precipitation was well above normal but recently it has been slightly deficient. Soil moisture is reported as good.

#### COLORADO RIVER TRIBUTARIES IN ARIZONA

The outlook for an adequate water supply for irrigated areas in Arizona at this time is poor. At higher elevations on the watersheds of the Gila, Salt, Little Colorado and Williams Rivers the snow is about the same as last year and only 50 percent of normal. Precipitation during the past month has been approximately one-third of normal in northern Arizona and about one-half on the Salt and Gila watersheds. Soil moisture conditions are reported as poor except in the higher elevations of the Salt River Valley where it is fair to good. Storage in the major reservoirs is extremely low. In the Salt River Valley reservoirs there is now in storage about 425,000 acre-feet in comparison with 725,000 a year ago. In the San Carlos Reservoir, on the Gila River the storage is 17,000 acre-feet. A year ago it was 26,000 and the average for the past ten years, as of February first, is 224,000.

Storage in Lake Mead, on January 15, was 17,600,000 acre-feet or about 1,800,000 less than a year ago.



## SNOW SURVEYS AND IRRIGATION WATER FORECASTS

## COLORADO RIVER BASIN

## STATUS OF RESERVOIR STORAGE, FEBRUARY 1, 1947

BASIN AND STREAM	RESERVOIR	USABLE CAPACITY (Thous.A Ft.)	THOUSANDS ACRE FEET IN STORAGE About February 1, 1947				
			1947	1946	1945	1944	10-year avg. 1936-45 *
COLORADO DRAINAGE							
Taylor River	Taylor Park	106.2	66.5	82.5	55.6	84.2	53.4
Los Pinos River	Vallecito	126.3	57.3	38.6	7.8	28.7	--
Groundhog Creek	Groundhog	21.7	--	8.5	8.0	15.0	--
Blue River	Green Mountain	146.9	86.0	72.0	63.0	30.0	
Colorado River	Lake Mead**	27935.0	17603.0	19417.0	19908.0	21230.0	21176.0
Colorado River	Lake Havasu**	688.0	602.0	572.0	577.0	582.0	496.0
SALT AND GILA DRAINAGE							
Salt River	Roosevelt	1420.0	169.9	476.4	618.8	793.3	508.8
"	Horse Mesa	245.1	208.1	223.3	219.4	217.7	181.5
"	Mormon Flat	58.0	31.9	21.4	21.2	14.7	32.6
"	Stewart Mt.	70.0	14.5	7.1	11.8	7.5	18.0
Verde River	Bartlett	200.0		7.8	11.1	16.3	53.7
Aqua Fria River	Carl Pleasant	173.0	2.9	3.4	3.9	2.7	17.5
Gila River	San Carlos	1200.0	17.0	26.1	105.7	281.6	224.2

\*Some for shorter periods.

\*\*Jan. 15, 1947



## SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for

## COLORADO RIVER BASIN

February 1, 1947

## SUMMARY OF FEBRUARY 1 SNOW SURVEYS AND COMPARISON OF DATA WITH THAT OF PREVIOUS YEARS BY WATERSHEDS

WATERSHEDS	Snow Depth			Water Content			Number Courses in Average	Snow Density			1947 Water Content in percent of		
	1946		1947	1946		1947		1946		1947	Twelve year Avg.*	1946	
	Twelve year Avg.*	In.	In.	Twelve Year Avg.*	In.	Percent		Percent	Percent				
	In.	In.	In.	In.	In.	Percent		Percent	Percent				
COLORADO RIVER	In.	In.	In.	In.	In.	In.	22	22	24	23	110	93	
Colorado River**	35.0	37.4	36.6	7.7	9.1	8.5							
Yampa River	41.4	47.4	43.0	9.7	11.8	9.1	4	23	25	21	94	77	
White River	38.5	42.6	42.6	9.4	9.2	10.5	2	24	22	25	112	114	
Roaring Fork	30.9	34.4	34.1	6.9	7.7	8.2	3	22	22	24	118	106	
Gunnison River	37.6	30.5	36.6	8.6	7.1	9.1	11	23	23	25	106	128	
Uncompahgre River	29.7	28.8	26.0	7.0	6.6	5.0	1	24	23	19	72	76	
Dolores River	28.7	21.6	25.1	6.1	5.0	4.9	4	21	23	20	80	98	
San Juan River	32.8	19.5	28.6	8.1	4.1	7.8	7	25	21	27	96	190	
Animas River	25.7	21.2	24.2	5.7	4.5	5.4	3	22	21	22	95	120	
Gila River	9.8	6.6	5.5	2.4	1.6	1.4	7	25	24	25	50	87	
Salt River	10.0	6.1	6.7	2.6	1.7	1.9	5	26	28	28	73	112	
**Above Grand Junction													*Some for shorter periods.

\*Some for shorter periods.

\*\*Above Grand Junction

## PRECIPITATION DATA

WATERSHED	STATE	Precipitation*		Departure from Normal		Precipitation*		Departure from Normal	
		October 1 to January 31		Inches		January		Inches	
		Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches
Colorado	Colorado	6.21	6.21	+0.35	1.07	1.07	-0.42	-0.42	-0.42
Green	Wyoming	5.13	5.13	+1.91	0.71	0.71	-0.33	-0.33	-0.33
San Juan	New Mexico	2.53	2.53	-0.67	0.50	0.50	-0.25	-0.25	-0.25
Colorado	Arizona	4.50	4.50	-0.41	0.45	0.45	-1.01	-1.01	-1.01
Gila	New Mexico	2.38	2.38	-1.04	0.53	0.53	-0.21	-0.21	-0.21

The accumulated precipitation since October 1 over the watershed of the Colorado River was below normal except on the Colorado River drainage in Colorado and on the Green River drainage in Wyoming. Precipitation was below normal over the entire drainage basin for January.

\*Precipitation tentative





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COLORADO RIVER SNOW SURVEYS, February 1, 1947

DRAINAGE BASIN and SNOW COURSE	LOCATION				SNOW COVER MEASUREMENTS							
	No. and State	Sec.	Twp.	Range	Elev.	Date of Survey	Snow Depth (Inches)	Water Content (inches)			Years of Record	Fast Record Av. Water Content (Inches)
								1947	1946	1945		
COLORADO RIVER (Above Grand Junction)												
Park View*	7 Colo.	24	5N	78W	9200	2/3	29.8	6.8	9.1	3.0	11	5.1
Phantom Valley	12 "	7	5N	75W	9300	2/1	24.4	4.8	5.8	3.4	12	5.0
Berthoud Pass	16 "	35	2S	75W	9700	1/27	30.7	6.8	11.2	7.3	12	8.6
Tennessee Pass*	19 "	21	8S	80W	10200	2/4	29.4	5.2	7.2	3.1	12	4.6
Ind. Pass Tunnel	33 "	30	11S	82W	10200	2/2	46.4	11.5	11.5	6.8	12	9.5
N. Lost Trail Cr.	34 "	26	11S	87W	9200	1/31	34.8	8.4	7.5	6.3	12	7.3
M. Fork Camp Gr.	37 "	16	3S	77W	9000	2/6	24.0	5.3	7.2	4.0	12	5.7
Fiddler Gulch	44 "	1	8S	80W	11000	1/31	44.0	9.3	11.2	5.5	12	8.0
Nast	45 "	1	9S	83W	8700	1/31	21.0	4.9	4.0	1.7	12	3.9
Mesa Lakes	56 "	35	11S	96W	10000	1/28	37.5	10.0	5.7	8.6	11	9.0
Lulu	59 "	25	6N	76W	10200	2/1	39.3	9.2	10.2	5.9	9	10.4
Willow Creek P.	62 "	1	4N	78W	9500	2/3	38.1	8.0	11.4	3.9	9	6.8
N. Inlet Grand L.	64 "	26	4N	75W	9000	2/4	24.9	5.6	6.1	3.7	10	4.9
Lake Irene	65 "	8	5N	75W	10600	2/2	54.7	13.6	13.6	6.7	10	11.9
Thunderbolt Peak	66 "	22	2N	74W	9500	2/2	45.7	12.4	11.8	8.8	10	9.6
Arrow	69 "	34	1S	75W	9900	1/27	24.7	5.6	6.0	4.3	10	5.8
Lapland	70 "	16	2S	76W	9300	2/3	31.2	6.0	8.2	3.8	8	8.1
Fremont Pass #2	79 "	2	8S	79W	11400	1/31	43.5	9.0	11.4	5.2	12	15.4
Trickle Divide	85 "	23	11S	94W	10000	1/31	69.4	21.1	10.0	16.4	8	15.4
Lynx Pass No. 2	91 "	27	2N	83W	9100	1/29	33.0	6.6	8.1	5.3	12	7.3
Shrine Pass	96 "	15	6S	79W	10500	1/31	38.3	7.5	12.2	6.1	6	8.7
Grizzly Peak	97 "	2	5S	76W	11250	1/31	39.5	9.9	11.8	5.6	6	9.2
Ivanhoe	100 "	12	9S	82W	10400	2/3	39.5	8.1	6.9	--	2	7.5
Glen-Mar Ranch	102 "	31	12S	77W	8850	2/6	24.7	6.1	--	--	1	6.1
YAMPA RIVER												
Dry Lake	6 Colo.	26	7N	84W	8200	1/31	47.4	8.8	12.8	7.8	8	10.1
Columbine Lodge*	8 "	21	5N	82W	9300	2/1	49.0	10.9	16.2	10.8	12	12.6
Elk River	9 "	6	10N	85W	8700	2/1	42.7	10.1	10.1	8.1	9	8.8
Lynx Pass No. 2*	91 "	27	2N	83W	9100	1/29	33.0	6.6	8.1	5.3	12	7.3
WHITE RIVER												
Burro Mountain	35 Colo.	15	2S	91W	9000	1/31	47.1	10.8	10.2	8.1	12	10.3
Rio Blanco	36 "	28	1N	88W	8500	1/31	38.2	10.2	8.3	6.6	9	8.5

\*On adjacent drainage

\*On adjacent drainage





## COLORADO RIVER SNOW SURVEYS, February 1, 1947

DRAINAGE BASIN and SNOW COURSE	LOCATION				SNOW COURSE MEASUREMENTS							
	No. and State	Sec.	Twp. Lat.	Range Long.	Elev.	Date of Survey	Snow Depth (Inches)	Water Content (inches)			Years of record	Av. Wager Content (Inches)
								1947	1946	1945		
ROARING FORK					COLORADO RIVER			In.	In.	In.		
Ind. Pass Tunnel	33 Colo.	30	11S	82W	10200	2/2	46.4	11.2	11.5	6.8	12	9.5
N.Lost Trail Cr.	34 "	20	11S	87W	9200	1/31	34.8	8.4	7.5	6.3	12	7.3
Nest	45 "	1	9S	83W	8700	1/31	21.0	4.9	4.0	1.7	12	3.9
Ivanhoe	100 "	12	9S	82W	10400	2/1	39.5	8.1	6.9	--	2	7.5
GUNNISON RIVER												
Crested Butte	18 Colo.	22	13S	86W	9000	1/30	31.2	6.1	7.1	6.6	12	7.1
Marshall Creek	42 "	24	48N	6E	10800	2/4	27.5	5.2	5.3	7.0	12	6.6
Poncha Creek*	43 "	19	48N	7E	10500	2/4	17.3	4.3	4.7	6.1	12	6.2
Park Cone	46 "	19	14S	82W	9700	1/31	27.4	4.9	4.6	2.9	12	4.6
Alexander Lake	53 "	2	12S	95W	10000	1/30	62.2	17.8	8.1	12.6	11	22.2
Snowshoe Mesa	55 "	14	13S	89W	7500	1/29	17.9	3.9	3.9	4.0	11	5.7
Ironton Park	58 "	29	43N	7W	9800	1/30	26.0	5.0	6.6	6.8	11	7.0
Trickle Divide	85 "	23	11S	94W	10000	1/31	69.4	21.1	11.7	16.4	8	15.4
Park Reservoir	87 "	34	11S	94W	9500	1/31	66.4	20.1	10.0	15.8	8	14.4
Porphyry Creek	89 "	19	49N	6E	10800	1/30	31.8	7.1	9.7	7.8	8	8.6
Sunshine Mt.No.2	94 "	35	44N	6W	10200	2/1	25.8	4.7	6.0	5.6	11	6.3
Kannah Creek	101 "	5	12S	95W	10700	1/28	50.6	14.1	--	--	1	--
UNCOMPAHGRE RIVER												
Ironton Park	58 Colo.	29	43N	7W	9800	1/30	26.0	5.0	6.6	6.8	11	7.0
SAN JUAN RIVER												
Wolf Creek Pass*	26 Colo.	4	37N	2E	10000	1/27	50.2	16.1	5.8	15.5	8	14.3
Upper San Juan	29 "	10	34N	1E	10000	1/27	56.4	16.7	7.7	17.1	8	16.4
Silverton Sub.S.	30 "	10	41N	7W	9400	1/31	16.2	4.3	3.1	3.1	9	3.7
Cascade	31 "	12	39N	9W	8850	1/31	30.5	6.8	3.8	6.4	9	6.4
Granite Peaks	93 "	24	37N	6W	7950	1/30	9.0	1.5	2.8	4.8	6	5.9
Chama Divide*	17 N.Mex.		36.9N	106.7W	7750	1/31	11.9	2.8	1.9	5.3	8	4.2
Chamita*	18 "		36.9N	106.7W	8500	1/31	26.2	6.5	3.3	9.8	6	6.1

\*On adjacent drainage



## COLORADO RIVER SNOW SURVEYS, February 1, 1947

DRAINAGE BASIN and SNOW COURSE	LOCATION				SNOW COURSE MEASUREMENTS					
	No. and State	Sec.	Twp.	Range Elev.	Date of Survey <sup>1</sup> (Inches)	Water Content (Inches)			Past Record Years of Record	Av. Water Content (Inches)
COLORADO RIVER										
LOLORES RIVER						In.	1947	1946	1945	
Rico	23 Colo.	11	39N	11W 8000	2/7	4.2	4.5	5.6	6	5.1
Telluride	24 "	6	42N	8W 8600	1/31	3.8	3.8	3.9	9	4.6
Lizard Head	25 "	24	41N	10W 10300	2/7	6.5	6.8	7.9	4	8.5
Lone Cone	90 "	23	41N	13W 8900	--	--	4.6	6.9	--	--
ANIMAS RIVER										
Silverton SS	30 Colo.	10	41N	7W 9400	1/31	4.3	3.1	3.1	9	3.7
Cascade	31 "	12	39N	9W 8850	1/31	6.8	3.8	6.4	9	6.4
Ironton Park*	58 "	29	43N	7W 9800	1/30	5.0	6.6	6.8	11	7.0
GILA RIVER										
Frisco Divide	11 N. Mex.	31	6S	20W 8000	1/31	1.1	1.4	4.4	10	2.2
State Line	14 "	6	6S	21W 8000	1/31	1.8	1.5	5.2	10	2.9
Taylor Creek	22 "	20	10S	10W 7850	1/31	1.1	1.7	1.6	6	0.9
Imman	23 "	6	11S	10W 7800	1/31	0.6	2.1	--	2	1.4
Nutriosio	3 Ariz.	23	6N	30E 8500	1/31	1.6	1.7	3.0	10	2.3
Beaver Head	4 "	13	4N	30E 8000	1/31	1.6	1.6	5.5	10	3.7
Coronado Trail	5 "	26	5N	30E 8000	1/31	2.2	1.4	4.5	10	3.6
SALT RIVER										
McNary	6 Ariz.	14	6N	23E 7200	1/31	3.2	2.6	4.6	9	3.6
Forestdale	7 "	2	9N	21E 6000	1/31	1.1	1.7	2.1	7	1.5
Milk Ranch	9 "	28	8N	23E 7000	1/31	1.4	1.4	2.2	7	2.1
Nutriosio*	3 "	23	6N	30E 8500	1/31	1.6	1.7	3.0	10	2.3
Coronado Trail*	5 "	26	5N	30E 8000	1/31	2.2	1.4	4.5	10	3.6

\*On adjacent drainage



COLORADO RIVER SNOW SURVEYS, February 1, 1947

DRAINAGE BASIN and SNOW COURSE	LOCATION				SNOW COURSE MEASUREMENTS				Years of Record	Past Record Av. Water Content (Inches)
	No. and State	Sec.	Twp.	Range	Elev.	Date of Survey	Snow Depth (Inches)	Water Content (Inches)		
								1947	1946	1945
								In.	In.	In.
VERDE RIVER										
Iron Springs*	11 Ariz.	22	14N	3W	6200	1/31	0	0	0	0
Camp Wood	12 "	3	16N	6W	5700	1/31	0	0	0	0
Angus Mountain	"	3	15N	2E	7100	1/31	0	New snow course	"	"
Mormon Lake*	"	13	18N	8E	7350	1/31	15.5	"	"	"
Fort Valley*	"	22	22N	6E	7350	1/31	14.2	"	"	"
Chalender*	"	27	22N	3E	7100	1/31	6.1	"	"	"
LITTLE COLORADO RIVER										
Forest Dale*	7 Ariz.	2	9N	21E	6000	1/31	4.6	1.1	2.1	1.7
McNary	6 "	11	8N	23E	7200	1/31	10.5	3.2	4.6	2.1
Nutrios*	3 "	23	6N	3CE	8500	1/31	5.9	1.6	1.7	3.0
Mormon Lake	"	13	18N	8E	7350	1/31	15.5	3.4	New snow course	"
Fort Valley	"	22	22N	6E	1350	1/31	14.2	1.0	"	"
WILLIAMS RIVER										
Iron Springs	11 Ariz.	22	14N	3W	6200	1/31	0	0	0	New Course
Camp Wood*	12 "	3	16N	6W	5700	1/31	0	0	C	"
Willow Ranch	"	16	21N	11W	5000	1/31	0	0	New snow course	"

\*On adjacent drainage



The following organizations cooperate in the snow surveys and irrigation water supply forecasts for the Colorado, Missouri-Arkansas and Rio Grande watersheds by furnishing funds or services.

STATE

Colorado State Engineer  
Wyoming State Engineer  
Utah State Engineer  
New Mexico State Engineer  
Montana State Engineer  
Nebraska State Engineer  
Colorado Experiment Station  
Colorado Extension Service  
Montana Experiment Station  
Utah Experiment Station

FEDERAL

Department of Agriculture  
Forest Service  
Soil Conservation Service  
Department of Interior  
Bureau of Reclamation  
Indian Service  
Geological Survey  
National Park Service  
Department of Commerce  
Weather Bureau  
War Department  
Army Engineer Corps

PUBLIC UTILITIES

Colorado Public Service Company  
Western Colorado Power Company  
Montana Power Company  
Denver and Rio Grande Western R. R. Company

MUNICIPALITIES

City of Bozeman  
City of Denver  
City of Boulder

WATER USERS ORGANIZATIONS

Poudre Valley Water Users' Association  
Arkansas Valley Ditch Association  
Colorado River Water Conservation District

IRRIGATION PROJECTS

Farmers Reservoir and Irrigation Company  
San Luis Valley Irrigation District  
Santa Maria Reservoir Company  
Costilla Land Company  
Uncompahgre Valley Water Users' Association  
Wyoming Development Company  
Goshen Irrigation District  
Kendrick Project  
Pathfinder Irrigation District  
Salt River Valley Water Users' Association  
San Carlos Irrigation and Drainage District  
Twin Lakes Reservoir and Canal Company

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U.S. AIR FORCE  
RECORDS  
JUN 28 1964  
U.S. AIR FORCE